Networkable Fan Coil Controller
Specification and Installation Instructions

MODELS

EFCB 24 *(24Vac / 2 relays)*

EFCB 240 *(240Vac / 2 relays)*

EFCB Series

TDU00 Series

TDU30 Series

TDU60 Series

Description

The OSS FC Series Networkable Fan Coil Controller, and 0BTFL24 and 1BTDU Series LCD Thermostats are designed for simple and accurate control of any fan coil application. The BACnet Fan Coil Controller is mounted inside the fan coil cabinet and incorporates a configurable fan coil algorithm, variable three speed fan control and either modulating or digital heating and cooling outputs. All inputs and high/low voltage outputs are centralized at the control module in the fan coil cabinet.

Applications

- Compatible with 2 or 4 pipe systems
- Fan coil unit (up to 3 speeds and/or analog 0-10 Vdc)
- Cooling signal (on/off, floating or modulating 0-10 Vdc)
- Heating signal (on/off, floating, pulse or modulating 0-10 Vdc)
- Cool, Heat, Reheat, Reheat with fan, Changeover, Fan, Humidify and Dehumidify by cooling.

Features

- Built-in configurable fan coil algorithms
- Up to 10 inputs and 15 outputs (configurable)
- Select direction on digital inputs and all outputs
- Selectable proportional control band and dead band
- Selectable fan speed contacts
- Independent cool/heat setpoint for NSB/OCC mode
- No occupancy and NSB override
- Selectable internal or external temperature sensor (10KΩ)
- Change over by contact or 10KΩ temperature sensor
- Internal and external temperature sensor calibration
- Freeze protection
- Multi level lockable access menu and setpoint
- Removable, raising clamp, non-strip terminals

Thermostat Features

- Backlit LCD with simple icon and text driven menus
- Select thermostat's default display
- BACnet service port via on-board mini USB connector
- Selectable Fahrenheit or Celsius scale
- 3-wire connection to controller and 4 push buttons

Network Communication

- BACnet® MS/TP or Modbus communication port
- Select MAC address via DIP switch or via network
- Automatic baud rate detection

BACnet MS/TP®

- Automatic device instance configuration
- Copy and broadcast configuration via thermostat menu or via BACnet to other controllers
- BACnet scheduler
- Firmware upgradeable via BACnet
- Support COV (change of value)

Modbus

- Modbus @ 9600, 19200, 38400 or 57600 bps
- RTU Slave, 8 bits (configurable parity and stop bits)
- Connects to any Modbus master

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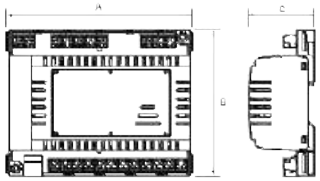
Controller Specifications

Description	OSS FC 24	OSS FC 240
Inputs	2 fixed analog inputs (external temp. and changeover sensors); 10KΩ or contact 4 analog inputs (0-10 Vdc or 10 KΩ via DIP switches) 3 configurable digital inputs 1 night setback or occupancy sensor input	
Outputs	4 analog , 0-10 Vdc configurable outputs (changeover/cooling/heating, fan, humidity) 4 configurable TRIAC outputs (changeover/cooling/heating) 3 speed fan (Motor and/or compressor inductive ratings: ¼ Hp/10 LRA/2.5 FLA 240 Vac Maximum Resistive ratings: 7 Amp/1680 W at 240 Vac Maximum); configurable up to 3 speeds 2 or 4 configurable digital outputs (changeover/cooling/heating, humidity, 3A dry contact)	
Power supply	24 Vac	240 Vac
Power consumption	8 VA max. 24 Vac thermal fused.	
BACnet	BACnet® MS/TP @ 9600, 19200, 38400 or 76800 bps (BAS-C)	
Modbus	Modbus RTU slave @ 9600, 19200, 38400 or 57600. Selectable parity and stop bit configuration: No parity, 2 stop bit Even parity, 1 stop bit Odd parity, 1 stop bit	
Communication Connections	24 AWG twisted-shield cable (Belden 9841 or equivalent)	
Electrical Connections	0.8 mm^2 [18 AWG] minimum	
Operating temperature	0ºC to 50ºC [32ºF to 122ºF]	
Storage temperature	-30ºC to 50ºC [-22ºF to 122ºF]	
Relative Humidity	5 to 95% non condensing	
Enclosure protection	IP 30 (EN 60529)	
Weight	635 g. [1.4 lb]	
Dimensions: A = 6.30" | 160mm B = 5.00" | 126mm C = 2.25" | 57mm		

Thermostat Specifications

Description	0BTFL24 and 1BTDU Series
Temperature Sensor (TFL24)	
Setpoint Range	10ºC to 40ºC [50ºF to 104ºF]
Control Accuracy	±0.5ºC [0.9ºF] @ 22ºC [71.6ºF] typical calibrated
Display Resolution	±0.1ºC [0.2ºF]
Humidity Sensor (TFLH24, TFLGH24, and 1BTDU models with Humidity Sensors)	
Setpoint Range	10 to 65%RH
Control Accuracy	±3.5% RH
Display Resolution	0.1%
CO_2 Sensor (TFLG24, TFLGH24, and 1BTDU models with CO_2 Sensors)	
Operating Principle	Self-calibrating, Non-Dispersive Infrared (NDIR)
Sensor Range	400 to 2000 ppm
Accuracy	±30 ppm ±3% of reading (Accuracy is defined after minimum 3 weeks of continuous operation)
Response Time	2 minutes by 90%
Other	
Electrical connection	3 wires to EFCB controller and 2 wires (optional) to BACnet network service port 0.8 mm^2 [18 AWG] minimum
BACnet service port	Mini USB connector
Power supply	24Vac or 24Vdc
Power consumption	1VA
Operating temperature	0ºC to 50ºC [32ºF to 122ºF]
Storage temperature	-30ºC to 50ºC [-22ºF to 122ºF]
Relative humidity	5 to 95 % non condensing
Enclosure protection	IP 30 (EN 60529)
Weight	120 g. [0.25 lb]
Note: The 0BTFL24/1BTDU thermostat functions only with the OSS FC controller. All the inputs/outputs are located on the OSS FC except for the temperature/humidity sensor built-in the 0BTFL24/1BTDU.	

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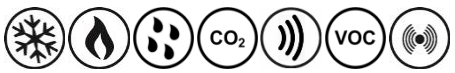
Models

Model #	Temp	RH	CO_2	PIR	VOC	Color
TDU00-100 TDF00-100	•					grey LCD, white enclosure
TDU00-101 TDF00-101	•	•				
TDU00-102 TDF00-102	•	•	•			
TDU00-104 TDF00-104	•			•		
TDU00-105 TDF00-105	•	•		•		
TDU00-106 TDF00-106	•	•	•		•	
TDU00-107 TDF00-107	•	•	•	•	•	
TDU00-108 TDF00-108	•	•	•	•		



TDU00 Series

TDF00 Series

Model #	Temp	RH	CO_2	PIR	VOC	Color
TDU30-100 TDF30-100	•					black LCD, black enclosure
TDU30-101 TDF30-101	•	•				
TDU30-102 TDF30-102	•	•	•			
TDU30-104 TDF30-104	•			•		
TDU30-105 TDF30-105	•	•		•		
TDU30-106 TDF30-106	•	•	•		•	
TDU30-107 TDF30-107	•	•	•	•	•	
TDU30-108 TDF30-108	•	•	•	•		

TDU30 Series

TDF30Series

Model #	Temp	RH	CO_2	PIR	VOC	Color
TDU60-100 TDF60-100	•					black LCD, white enclosure
TDU60-101 TDF60-101	•	•				
TDU60-102 TDF60-102	•	•	•			
TDU60-104 TDF60-104	•			•		
TDU60-105 TDF60-105	•	•		•		
TDU60-106 TDF60-106	•	•	•		•	
TDU60-107 TDF60-107	•	•	•	•	•	
TDU60-108 TDF60-108	•	•	•	•		

TDU60 Series

TDF60 Series

Features

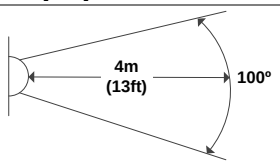
Onboard Sensors

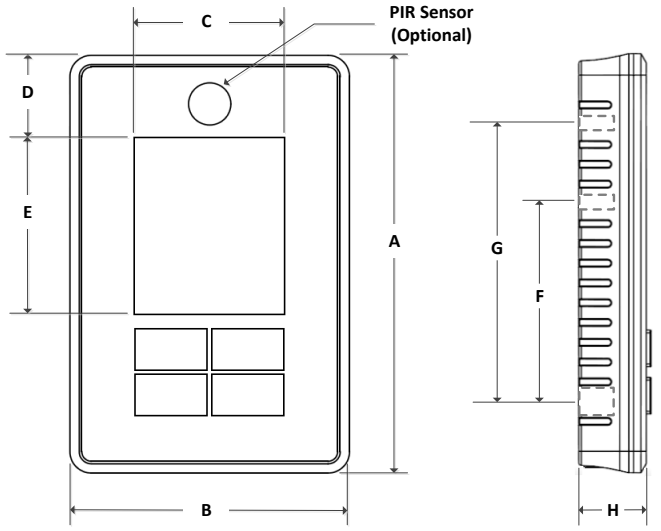
- Temperature sensor (°C/°F)
- Humidity sensor (%RH), select models
- Carbon dioxide sensor (CO_2), select models
- PIR motion detection sensor, select models
- Volatile organic compounds (VOC), select models

Functions

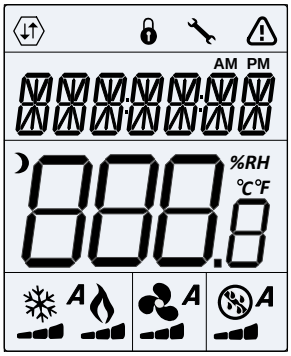
- TDU series used to configure and operate the EVCB VAV controllers
- TDF series used to configure and operate the EFCB Fan Coil controllers
- Three wire connection between room sensor and controller
- Elegant design
- Universal wall-mount design
- Selectable Fahrenheit or Celsius scale
- Network service port via on-board mini USB connector
- Dimensions: 124mm x 83mm x 20mm (4.88” x 3.25” x 0.78”)
- Dimensions for models with CO_2 sensor: 124mm x 83mm x 24mm (4.88” x 3.25” x 0.95”)

Technical Specifications

Description	TDU00 / TDU30 / TDU60 / TDF00 / TDF30 / TDF60 Series
Temperature Sensor	
Setpoint Range	10ºC to 40ºC [50ºF to 104ºF]
Control Accuracy	Temperature: ±0.4ºC [0.8ºF]
Display Resolution	±0.1ºC [0.2ºF]
Humidity Sensor (select models)	
Setpoint Range (EFCB only)	10 to 65%RH
Control Accuracy (EFCB only)	±3.5% RH
Display Resolution	0.1%
CO_2 Sensor (select models)	
Operating Principle	Self-calibrating, Non-Dispersive Infrared (NDIR)
Sensor Range	400 to 2000 ppm
Accuracy	±30 ppm ±3% of reading (Accuracy is defined after minimum 3 weeks of continuous operation)
Response Time	2 minutes by 90%
PIR Motion Sensor (select models)	
Operating Principle	Passive Infrared (PIR)
Detection Angle	100º
Detection Distance	4m [13ft]
Detection Area	
VOC Sensor (select models)	
Operating Principle	Self-calibrating, Non-Dispersive Infrared (NDIR)
Sensor Range	0-1000 ppb isobutylene equivalent tVOCs
Response Time	< 5 seconds for tVOC
Start up Time	15 minutes
Other	
Electrical connection	Three wires to EVCB/EFCB controller and two wires to BACnet/Modbus network 0.8 mm^2 [18 AWG] minimum
Network service port	Mini USB connector
Power supply	24Vac
Power consumption	1VA
Operating temperature	0ºC to 50ºC [32ºF to 122ºF]
Storage temperature	-30ºC to 50ºC [-22ºF to 122ºF]
Relative Humidity	5 to 95 % non-condensing
Degree of protection of housing	IP 30 (EN 60529)
Weight	135 g. [0.30 lb]

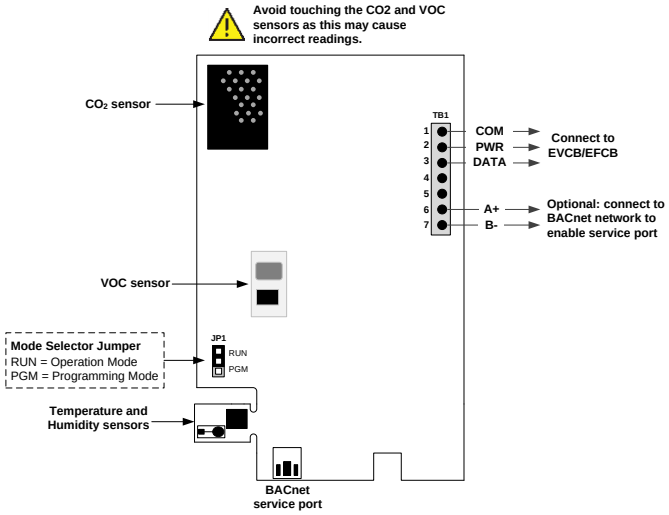
Description	TDU00 / TDU30 / TDU60 / TDF00 / TDF30 / TDF60 Series
Dimensions: A = 4.88” | 124mm B = 3.25” | 83mm C = 1.75” | 44mm D = 0.96” | 24mm E = 2.07” | 53mm F = 2.36” | 60mm G = 3.28” | 83mm H = 0.78” | 20mm *(without CO_2)* 0.95” | 24mm *(with CO_2)*	

Interface



	Network Communication		*User Lock*		*Programming Mode (Technician Setting)*
	Alarm Status		*Energy Saving Mode (NSB/OCC)*	AM PM	*Time*
°C *°F* *%RH*	*ºC: Celsius Scale* *ºF: Fahrenheit Scale* *%RH: Humidity*	*A*	*Automatic Mode*		*Cooling*
	Heating		*Fan*		*Humidify/ De-humidify (EFCB only)*

Wiring



We strongly recommend that all Neptronic products be wired to a separate grounded transformer and that transformer shall service only Neptronic products. This precaution will prevent interference with, and/or possible damage to incompatible equipment.

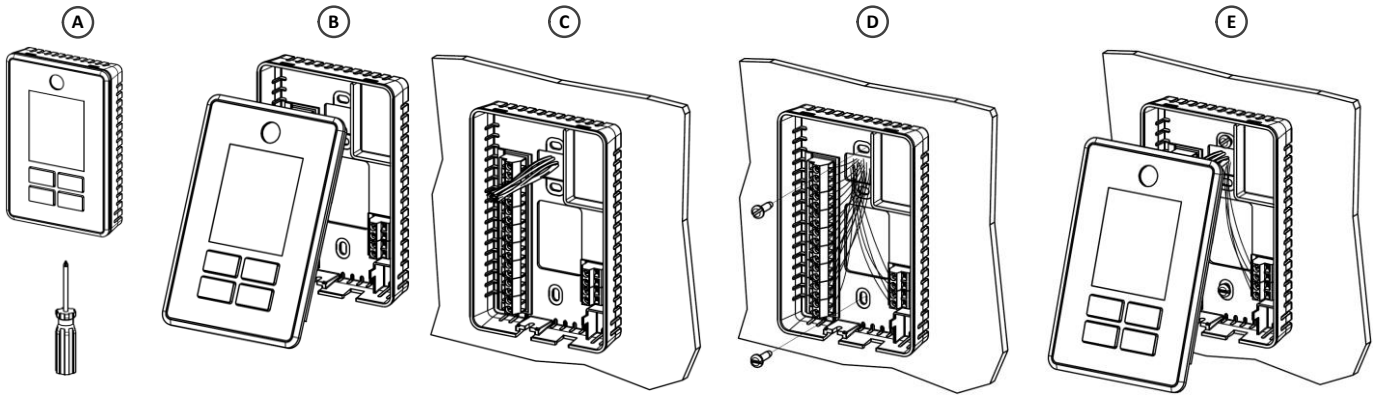
Mode Selection (JP1)

JP1 RUN PGM	**RUN:** Digital Room Sensor is in **Operation Mode**. Digital Room Sensor must be set in this mode to operate properly. If not locked, following setpoint and control mode options can be modified by the end user: • Heating and Cooling ON • Cooling only ON • Heating only ON • OFF (EFCB only) • Fan ON • Humidify and De-humidify ON • Humidify only ON • Dehumidify only ON
JP1 RUN PGM	**PGM:** Digital Room Sensor is set in **Programming Mode**.

Mounting Instructions

CAUTION: Remove power to avoid a risk of malfunction.

A. Remove the captive screw that's holding the base and the front cover of the unit together.
B. Lift the front cover of the unit to separate it from the base.
C. Pull all wires through the holes in the base.
D. Secure the base to the wall using wall anchors and screws (supplied). Make the appropriate connections.
E. Mount the control module on the base and secure using the screw.



Access to Menus

The menus and options are the same for both the TDU and TDF Digital Room Sensors. However, the action button or the button used to access the menus and save changes is different for each Digital Room Sensor.

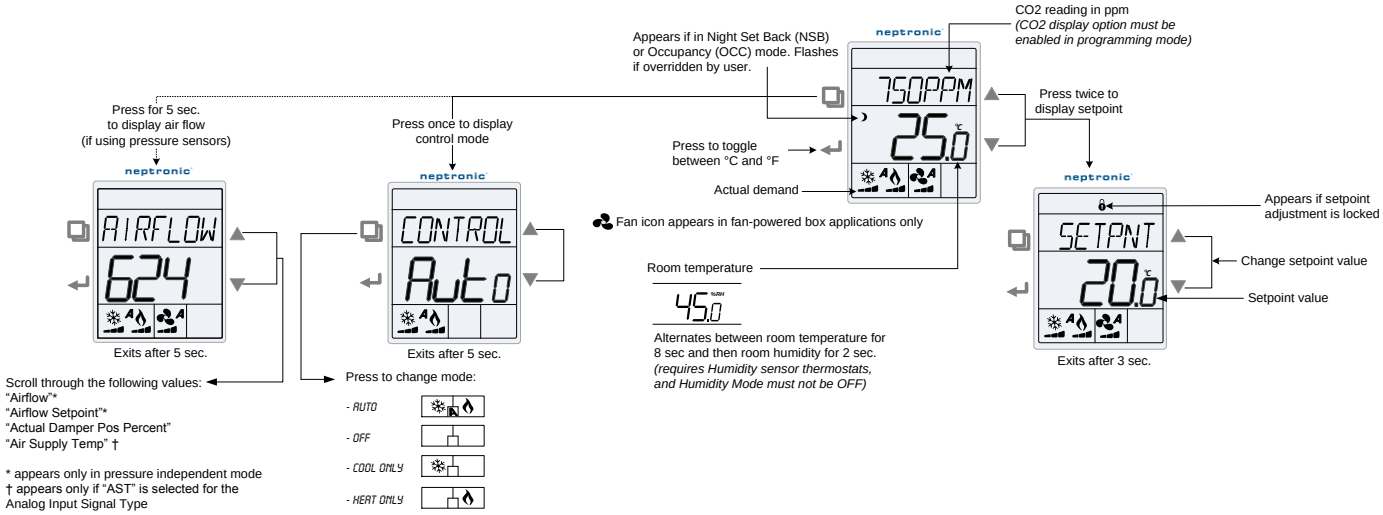
Action Buttons on Digital Room Sensor

Action Button	
TDU	**TDF**
	
	

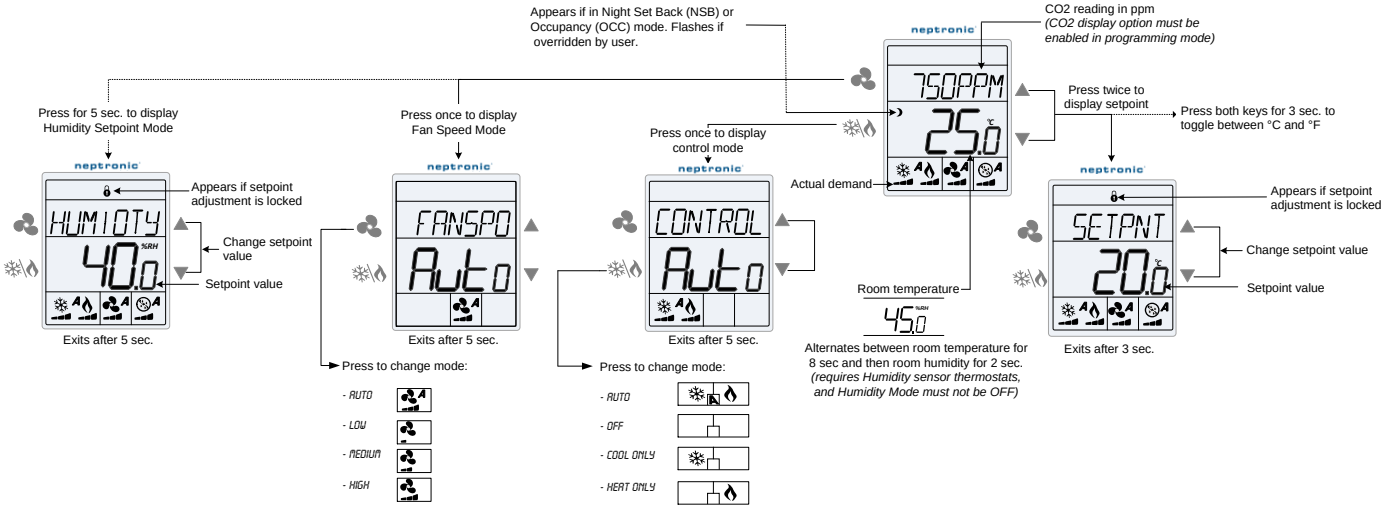
Operation Mode

The Mode Selector Jumper JP1 must be set to the RUN position (Operation Mode). Refer to the Wiring section on page 3.

EVCB



EFCB



Power Up

Upon power up, the LCD illuminates and all segments appear for 2 seconds. The Digital Room Sensor then displays its current version for 2 seconds followed by the current version of the controller for 2 seconds. Pressing any key on the Digital Room Sensor illuminates the LCD for 4 seconds.

Temperature Display and Setpoint

The Digital Room Sensor displays the temperature reading. If the sensor is disconnected or short circuited, the unit displays the sensor's limits. To toggle the temperature scale between ºC and ºF, press the ↵ key on the TDU or both the ▲ and ▼ keys for 3 seconds on the TDF.

To display the setpoint, press the ▲ or ▼ key twice. The setpoint appears for 5 seconds. To adjust the setpoint, press the arrow keys while the temperature is displayed. If the setpoint adjustment has been locked, the lock symbol appears.

CO_2 (Digital Room Sensor with CO_2 Option)

If enabled via the configuration menu, the Digital Room Sensor displays the CO_2 reading on the first line above the temperature reading. If CO_2 display is enabled, the time will not be displayed.

Humidity Setpoint Display and Adjustment (Digital Room Sensor with Humidity Option)

If enabled via the configuration menu for the EVCB and in a humidity mode other than OFF for the EFCB, the Digital Room Sensor displays the temperature reading for 8 seconds and then displays the humidity reading for 2 seconds. If the sensor is disconnected or short circuited, then the unit displays the sensor's limit.

To access the humidity setpoint (EFCB only), press the key for 5 seconds. The humidity setpoint will be displayed for 5 seconds. To adjust the setpoint press the ▲ and ▼ keys while the setpoint is displayed. The unit will return to normal mode if you do not press any key for 3 seconds. The changed values will be saved automatically.

Control Mode

To access the Control Mode, press the key on the TDU or on the TDF. The Control Mode appears for 5 seconds. Press the (TDU) or (TDF) key to scroll through the following control modes. These options can vary depending on the options configured by the installer.

- Auto (Automatic Cooling or Heating)
- Cooling only (on, with cooling symbol)
- Heating only (on, with heating symbol)
- OFF (if it is not disabled in Programming Mode)

Fan Speed Selection Mode (EFCB Only)

To access the Fan Speed selection mode, press the key. The mode appears for 5 seconds. These options can vary depending on the fan speed signal and auto mode settings. If in No Occupancy mode, the button now serves as the override button.

- Automatic speed. Available only if enabled by the installer.
- Low speed
- Medium speed
- High speed

Night Set Back (NSB)

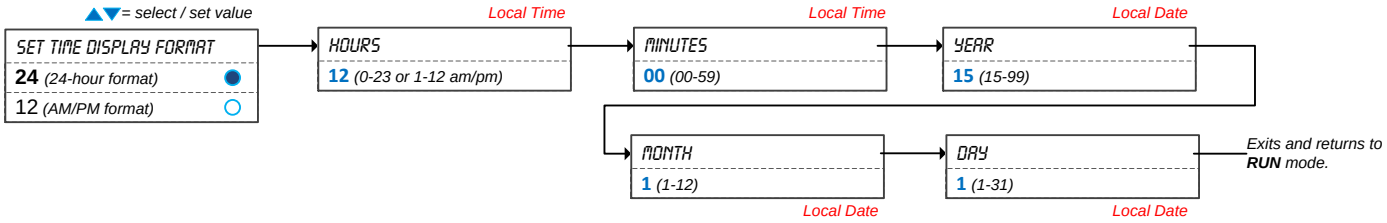
This function is only available if enabled by your installer. If the appropriate digital input contact is triggered, the Digital Room Sensor enters NSB Mode (the ☽ symbol appears) and uses the NSB setpoints defined in program mode. Press any key to override NSB for the delay defined in program mode (default: 120 minutes). The ☽ symbol flashes to indicate that the NSB mode is overridden (during this time the standard setpoints are used). If the NSB Mode was set to OFF, all outputs will be off for the duration of the period and cannot be overridden.

Occupancy Mode

This function is only available if enabled by your installer. If the appropriate digital input contact is triggered, the Digital Room Sensor enters Occupancy Mode (the ☽ symbol appears) and uses the NoOcc setpoints defined in program mode. If not locked, no occupancy mode can be overridden for a period by pressing the ( ) button. Each time you press the ( ) button, 15 minutes are added to the override (up to a maximum defined in program mode). Press the fan ( ) button until “0” is displayed to disable the override. The ☽ icon will flash and the remaining override time will be displayed in minutes.

Set Time and Date

1. Press and hold the ↵ (❄/🔥) button for 5 seconds
2. Use the arrow keys to set the desired value. Press the ⧉ (🌀) button to save and go to the next step. Press the ↵ (❄/🔥) button to go to the previous step without saving.



Airflow and Air Supply Temperature

Press and hold the ⧉ (🌀) button for 5 seconds and use the arrow keys to view the *"AIRFLOW"*, *"AIRFLOW SETPNT"*, *"ACTUAL DAMPER POS PERCENT"* and *"AIR SUPPLY TEMP"*. After 5 seconds without any action, the Digital Room Sensor returns to operation mode. The air supply temperature appears only if analog input AI1 or AI2 are configured with the AST option.

Backlight and Contrast Level Adjustment

For models with the grey LCD screen, the backlight level can be adjusted. For models with the black LCD screen, the contrast level can be adjusted. Press and hold the ↵ (❄/🔥) and ⧉ (🌀) buttons for 5 seconds and enter the password **367** to gain access to the backlight and contrast level adjustment settings. Use the ▲ and ▼ keys to adjust the backlight or contrast level in three modes: User (digital room sensor is in operation), Occupancy (digital room sensor is idle and occupancy state is active) and No Occupancy (digital room sensor is idle and occupancy state is inactive). Press the ⧉ (🌀) key to save any changes.

Notes

	Recycling at end of life: please return this product to your One Sightsolutions for recycling. If you need to find the nearest One Sightsolutions authorized distributor, please consult **Web:onesight.solutions**.

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